

In the Claims:

Please cancel claims 1-55 and add new claims 56-95 as follows.

1-55 (Canceled)

56. (New) A method for communicating with phone lines across an isolation barrier that comprises a plurality of isolation elements, the method comprising:

generating an encoded digital differential signal from a digital data signal, wherein the encoded digital differential signal includes control data and the digital data signal;
and

communicating said encoded digital differential signal from phone line side circuitry to powered side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor, wherein bidirectional communication exists through the first and second isolation capacitors;

providing a clock signal from the powered side circuitry to the phone line side circuitry through at least one of the plurality of isolation elements; and

providing power from the powered side circuitry to the phone line side circuitry while still maintaining the isolation required by the phone line isolation regulatory standards.

57. (New) The method of claim 56, wherein said control data comprises phone line status information.

58. (New) The method of claim 56, wherein the encoded digital differential signal includes both data information and control information.

59. (New) The method of claim 56, further comprising providing a clock signal from the powered side circuitry to the phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor.

60. (New) The method of claim 56, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

61. (New) The method of claim 56, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

62. (New) A method for communicating with phone lines across an isolation barrier that comprises a plurality of isolation elements, the method comprising:

generating an encoded digital differential signal from a digital data signal, wherein the encoded digital differential signal includes control data and the digital data signal; and

communicating said encoded digital differential signal from phone line side circuitry to powered side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor, wherein bidirectional communication exists through the first and second isolation capacitors;

providing a clock signal from the powered side circuitry to the phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor; and

providing power from the powered side circuitry to the phone line side circuitry to generate at least one power supply within the phone line side circuitry while still

maintaining the isolation required by the phone line isolation regulatory standards;

wherein the encoded digital differential signal includes both data information and control information.

63. (New) The method of claim 62, wherein said control data comprises phone line status information.

64. (New) The method of claim 62, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

65. (New) The method of claim 62, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

66. (New) A method for communicating with phone lines across an isolation barrier that comprises a plurality of isolation elements, the method comprising:

converting a signal received from phone lines into a digital data stream;

communicating said digital data stream as a digital differential signal from bi-directional connections on phone line side circuitry to bi-directional connections on powered side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor, wherein bi-directional communication occurs across the first and second isolation capacitors;

providing a clock signal from the powered side circuitry to the phone line side circuitry through at least one of the plurality of isolation elements; and

providing power from the powered side circuitry to the phone line side circuitry while still maintaining the isolation required by the phone line isolation regulatory standards.

67. (New) The method of claim 66, further comprising:

communicating a digital bit stream across said isolation barrier from said powered side circuitry to said phone line side circuitry; and

recovering said clock signal within said phone line side circuitry from said digital bit stream.

68. (New) The method of claim 66, further comprising encoding said digital data stream prior to said communicating step.

69. (New) The method of claim 66, wherein the digital differential signal includes both data information and control information.

70. (New) The method of claim 66, further comprising providing a clock signal from the powered side circuitry to the phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor.

71. (New) The method of claim 66, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

72. (New) The method of claim 66, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

73. (New) A method for communicating with phone lines across an isolation barrier that comprises a plurality of isolation elements, the method comprising:

converting a signal received from phone lines into a digital data stream;

communicating said digital data stream as a digital differential signal from bi-directional connections on phone line side circuitry to bi-directional connections on powered side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor;

providing a clock signal from the powered side circuitry to the phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor; and

providing power from the powered side circuitry to the phone line side circuitry to generate at least one power supply within the phone line side circuitry while still maintaining the isolation required by the phone line isolation regulatory standards;

wherein the digital differential signal includes both data information and control information.

74. (New) The method of claim 73, further comprising:

communicating a digital bit stream across said isolation barrier from said powered side circuitry to said phone line side circuitry through said at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor; and

recovering said clock signal within said phone line side circuitry from said digital bit stream.

75. (New) The method of claim 73, further comprising encoding said digital data stream prior to said communicating step.

76. (New) The method of claim 73, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

77. (New) The method of claim 73, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

78. (New) A method for communicating with phone lines from a user end of the phone lines across an isolation barrier that comprises a plurality of isolation elements, the method comprising:

generating an encoded digital differential signal from a digital data signal, wherein the encoded digital differential signal includes control data and the digital data signal;
and

communicating said encoded digital differential signal from user end powered side circuitry to user end phone line side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor, wherein bidirectional communication exists through the first and second isolation capacitors;

providing a clock signal from the user end powered side circuitry to the user end phone line side circuitry through at least one of the plurality of isolation elements; and

providing power from the user end powered side circuitry to the user end phone line side circuitry while still maintaining the isolation required by the phone line isolation

regulatory standards.

79. (New) The method of claim 78, wherein the encoded digital differential signal includes both data information and control information.

80. (New) The method of claim 78, further comprising providing a clock signal from the user end powered side circuitry to the user end phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor.

81. (New) The method of claim 78, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

82. (New) The method of claim 78, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

83. (New) A method for communicating with phone lines from a user end of the phone lines across an isolation barrier that comprises a plurality of isolation elements, the method comprising:

generating an encoded digital differential signal from a digital data signal, wherein the encoded digital differential signal includes control data and the digital data signal;
and

communicating said encoded digital differential signal from user end powered side circuitry to user end phone line side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor, wherein bidirectional communication exists through the first and second isolation capacitors;

providing a clock signal from the user end powered side circuitry to the user end phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor; and

providing power from the user end powered side circuitry to the user end phone line side circuitry to generate at least one power supply within the phone line side circuitry while still maintaining the isolation required by the phone line isolation regulatory standards;

wherein the encoded digital differential signal includes both data information and control information.

84. (New) The method of claim 83, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

85. (New) The method of claim 83, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

86. (New) A method for communicating with phone lines from a user end of the phone lines across an isolation barrier that comprises a plurality of isolation elements, the method , comprising:

converting a digital signal into a digital data stream; and

communicating said digital data stream as a digital differential signal from a bi-directional connection on user end powered side circuitry to a bi-directional connection on user end phone line side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor;

providing a clock signal from the user end powered side circuitry to the user end phone line side circuitry through at least one of the plurality of isolation elements; and

providing power from the user end powered side circuitry to the user end phone line side circuitry while still maintaining the isolation required by the phone line isolation regulatory standards.

87. (New) The method of claim 86, further comprising encoding said digital data stream prior to said communicating step.

88. (New) The method of claim 86, wherein the digital differential signal includes both data information and control information.

89. (New) The method of claim 86, further comprising providing a clock signal from the user end powered side circuitry to the user end phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor.

90. (New) The method of claim 86, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

91. (New) The method of claim 86, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.

92. (New) A method for communicating with phone lines from a user end of the phone lines across an isolation barrier that comprises a plurality of isolation elements, the method , comprising:

converting a digital signal into a digital data stream; and

communicating said digital data stream as a digital differential signal from bi-directional connections on user end powered side circuitry to bi-directional connections on user end phone line side circuitry across at least two of the isolation elements of said isolation barrier, the at least two isolation elements comprising at least a first isolation capacitor and a second isolation capacitor;

providing a clock signal from the user end powered side circuitry to the user end phone line side circuitry through at least one of the plurality of isolation elements that is separate from the first isolation capacitor and the second isolation capacitor; and

providing power from the user end powered side circuitry to the user end phone line side circuitry to generate at least one power supply within the phone line side circuitry while still maintaining the isolation required by the phone line isolation regulatory standards;

wherein the digital differential signal includes both data information and control information.

93. (New) The method of claim 92, further comprising encoding said digital data stream prior to said communicating step.

94. (New) The method of claim 92, wherein each of said plurality of isolation elements of said isolation barrier comprises a capacitor.

95. (New) The method of claim 92, wherein at least a portion of said plurality of isolation elements of said isolation barrier each comprises a capacitor.